

REMARKS

Claims 1-5, 15, 18, 19, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hata et al., US 2003/0057434 A1 (hereinafter "Hata") in view of Sun et al. "Polarization anisotropy of the photoluminescence of M-plane (In,Ga)N/GaN multiple quantum wells" (hereinafter "Sun"). Applicants respectfully traverse the rejection.

Regarding the motivation to combine, the Examiner states on page 8 of the office action:

[I]t is well known in the art [that] increasing the polarization degree in the light emitting layer would obtain excellent brightness [citation omitted]. Also, Sun et al. teaching in the left column of page 3850 growing the III-nitride layer substantially parallel to <0001> axis would result in improved lasing performance.

Applicants submit herewith Chakraborty et al., "Nonpolar InGaN/GaN emitters on reduced-defect lateral epitaxially overgrown *a*-plane GaN with drive-current-independent electroluminescence emission peak," Appl. Phys. Lett., Vol. 85, No. 22, 20 November 2004. Chakraborty et al. teaches at column 2, page 5144, first full paragraph:

The output power at 20 mA forward current was 240 μ W, corresponding to an external quantum efficiency (EQE) of 0.4%. DC output power as high as 1.5 mW was measured for a drive current of 250 mA. The EQE increased as the drive current was increased, attaining a maximum of 0.42% at 30 mA, and then decreased rapidly as the forward current was increased beyond 30 mA. The comparably low EQE for these LEDs can be attributed partially to the poor reflectivity of the *p*-contact and partially to the "dark" defective window regions of the LEO, which do not emit light. We anticipate significant improvement in EQE by optimization of all aspects of the LED structure.

Contrary to the Examiner's assertion that a combination of Hata and Sun would improve lasing performance, the above-quoted article teaches that a device with an *a*-plane multiple quantum well light emitting region has an EQE of 0.4%, which may be an order of magnitude less than a conventional device. The above-quoted passage also refers to this efficiency as "comparably low." Accordingly, a person of skill in the art reading the above-quoted passage would expect that combining Hata with Sun would NOT result in "improved

lasing performance” as asserted by the Examiner, and would therefore not be motivated to combine Hata with Sun.

Since the Examiner has failed to provide a motivation to combine Hata and Sun, the Examiner has failed to demonstrate a prima facie case of obviousness. Applicants respectfully submit that claim 1 is allowable over Hata and Sun.

Claims 2-5, 15, 18, 19, 22, and 23 depend from claim 1 and are therefore allowable over Hata and Sun for at least the same reasons as claim 1. In addition, regarding claims 22 and 23, Applicants have found no teaching in either Hata or Sun of operation “at a current density greater than 10 A/cm²” as recited in claim 22, or of operation “at a current density greater than 100 A/cm²” as recited in claim 23.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hata and Sun and further in view of Goetz et al., US 2002/0171092 A1 (hereinafter “Goetz”). Claim 7 depends from claim 1. Goetz is cited relative to a claim element unrelated to the deficiencies of Hata and Sun with respect to claim 1. Claim 7 is thus allowable over Hata, Sun, and Goetz for at least the same reason claim 1 is allowable over Hata and Sun. In addition, Applicants respectfully disagree with the Examiner’s position on page 5 of the office action that “GaInN and AlInGaN are recognized in the art as equivalents” and respectfully request that the Examiner supply some support for this assertion.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hata and Sun and further in view of Ibbetson et al., US 6,515,313 (hereinafter “Ibbetson”). Claims 8-10 depend from claim 1. Ibbetson is cited relative to claim elements unrelated to the deficiencies of Hata and Sun with respect to claim 1. Claims 8-10 are thus allowable over Hata, Sun, and Ibbetson for at least the same reason claim 1 is allowable over Hata and Sun.

Claims 11-14, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hata and Sun and further in view of Bour et al., US 2003/0020085 A1 (hereinafter

"Bour"). Claims 11-14, 16, and 17 depend from claim 1. Bour is cited relative to claim elements unrelated to the deficiencies of Hata and Sun with respect to claim 1. Claims 11-14, 16, and 17 are thus allowable over Hata, Sun, and Bour for at least the same reason claim 1 is allowable over Hata and Sun.

Applicants thank the Examiner for indicating that claim 6 is allowable if rewritten in independent form.

In view of the above arguments, Applicants respectfully request allowance of claims 1-23. Should the Examiner have any questions, the Examiner is invited to call the undersigned at (408) 382-0480.

Respectfully submitted,
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